Ontario

Mobile Compacting Equipment Safety Guideline

Health and Safety Guidelines

105-02250/

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Published May 2004

© Queen's Printer for Ontario, 2004

ISBN 0-7794-6175-4

Le présent document est aussi disponible en français sous le titre - « Directives de sécurité pour l'équipement de compactage mobile » [ISBN 0-7794-6177-0]

Mobile Compacting Equipment Safety Guideline

Occupational Health and Safety Branch
Ministry of Labour

May 2004

INTRODUCTION

Application

This guideline was developed to primarily deal with point-of-operation guarding but also addresses lock-out, blocking and fall arresting systems. There are many other hazards that must be considered in order to ensure worker health and safety while operating mobile compacting equipment. Some of the other important issues (not covered in this guideline) include:

- Personal protective equipment
- Hygiene issues
- Ergonomics
- Traffic control
- Reflective vests

Requirements as set out in the Occupational Health and Safety Act (the Act) and regulations will be referenced where appropriate.

This guideline is intended to provide general assistance where potential hazards are encountered. It is not intended to provide an all-inclusive list of hazards and controls. The act and regulations should be consulted for the proper application of the law. Inspectors appointed under the act have the discretion to enforce the act and regulations and may refer to this guideline for assistance.

For further information on the act or regulations, you should contact the nearest Ministry of Labour area office. An occupational health and safety inspector or other person will provide additional guidance as required. A list of the addresses and phone numbers of these offices is given on the Ministry of Labour website at: http://www.gov.on.ca/LAB/english/about/reg_offices.html or by phoning toll-free 1-800-268-8013 (Province-wide)

Acknowledgements

The Ministry of Labour wishes to thank the employer and worker members of the task force, which developed this guideline. Their contributions and co-operation resulted in a product that will improve worker health and safety when operating mobile compacting equipment.

Contributors

Some of the task force members included the Ontario distributor of mobile compacting equipment and representatives from large municipalities. The organizations represented included the following:

Municipal Engineers Association (MEA)
Ontario Waste Management Association (OWMA)
Municipal Waste Integration Network (MWIN)
Municipal Health and Safety Association of Ontario (MHSAO)
Ontario Municipal Health and Safety Representatives Association (OMHSRA)
Canadian Union of Public Employees (CUPE)

The Ontario Ministry of Labour was represented by Walter Schilke (Regional Engineer) and Don Brown (Provincial Specialist).

Mobile Compacting Equipment Descriptions

Rear Loading Compacting Equipment:

A vehicle utilized to collect both residential and Industrial Commercial and Institutional (IC & I) waste and recyclable materials. Materials are placed manually into an opening in the rear of the vehicle.

Side Loading Compacting Equipment:

A vehicle utilized to collect both residential and IC & I waste and recyclable materials. Materials are placed manually into an opening in the side of the vehicle.

Type 2: 'Torpedo design'

Rear Loader & Side Loader Container Lifting Equipment:

Vehicles utilized to collect both residential and IC & I waste and recyclable materials. Semi or fully automated systems mechanically lift and dump containers of material either into a rear or side opening of a vehicle.

Multi-Compartment Recycling Vehicles:

A vehicle utilized to collect and segregate residential and IC & I recyclable materials. Materials are segregated into multiple hoppers on the side of the vehicle and then mechanically lifted and dumped into compartments on the top of the vehicle.

Combination Collection Equipment:

Vehicles that are either rear loading or side loading design (as above) utilized to collect both waste and recyclable materials. Hoppers on the rear or side of the vehicle mechanically lift and dump waste and recyclable materials into compartments.

Front Loading Compacting Equipment:

A vehicle utilized to collect residential and IC & I waste and recyclable materials contained in bins. The vehicle utilizes front 'forks' to mechanically lift bins and dump materials into an opening on the top of the vehicle.

Mobile Compacting Equipment Safety Guideline

This Guideline expands upon and replaces the Ontario Ministry of Labour Guideline "Safety Standard for Rear Loading Mobile Refuse Compacting Trucks" dated March 5th, 1993. The Guideline applies the same point-of-operation guarding principles as found in the 1993 Guideline. The requirements in this Guideline are additional to ANSI Z245.1-1999 for "Equipment Technology and Operations for Wastes and Recyclable Materials - Mobile Wastes and Recyclable Materials Collection, Transportation, and Compacting Equipment Safety Requirements". Any reference in ANSI Z245.1-1999 to any other Standard or Regulation does not necessarily mean that the Ministry has accepted the referenced Standard or Regulation.

The Guideline applies to the following:

I. **Rear-loading compacting equipment**

II. **Side-loading compacting equipment**

II (a). **Side-loading compacting equipment (Type 2: 'Torpedo Design' - ANSI Z245.1 Figure 8a)**

III. **Rear-loader & Side-loader container lifting equipment**

IV. **Multi-compartment recycling vehicles**

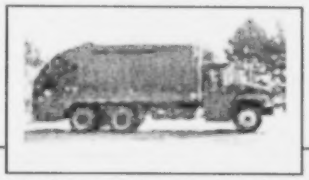
V. **Combination collection equipment & other vehicles not identified in the guideline**

VI. **Front-loading compacting equipment**

The additional requirements to ANSI Z245.1-1999 deal with **"point-of-operation guarding"** as per section 25, 26 and 28 of Regulation 851. In addition requirements for **"lock-out"** under section 76 and **"blocking"** under section 75 of Regulation 851 are included. Requirements for "**fall protection**" in general and those under section 85 of Regulation 851 are included in particular for multi-compartment recycling vehicles and front-loading compacting equipment both with needed access to top platforms.

Employers can make use of this guideline in assisting them in meeting their duties under the Occupational Health and Safety Act, Section 25 (2) (h). The Industrial Establishments Regulation 851 is cited as setting out reasonable precautions that may be taken in the circumstances for the protection of a worker in this context.

Rear-loading compacting equipment



A worker(s) shall be protected from any pinch point at the point-of-operation during the packing cycle either by:

A) A movable guard that is interlocked so that it is in place before the packer panel is within 150 mm (six inches) of the pinch point. The movable guard shall be designed so that it shall not be hazardous in itself and so that the hazard from projectiles during the packing cycle is eliminated.

For guard interlocking see Appendix "A".

Or by all of the following safety features:

B)

1. A control that provides an interrupted cycle. Actuation of the control shall cause the packer panel to stop not less than 150 mm (six inches) or more than 406 mm (sixteen inches) from any pinch point. The control shall require re-actuation by a subsequent motion of the worker to complete the packing cycle.

2. Actuation of the control to complete the packing cycle shall be by sustained manual pressure. The control shall be located so that the worker actuating the control:

   (i) cannot reach any pinch point at the point-of-operation; and
   (ii) has a clear view of the point-of operation.

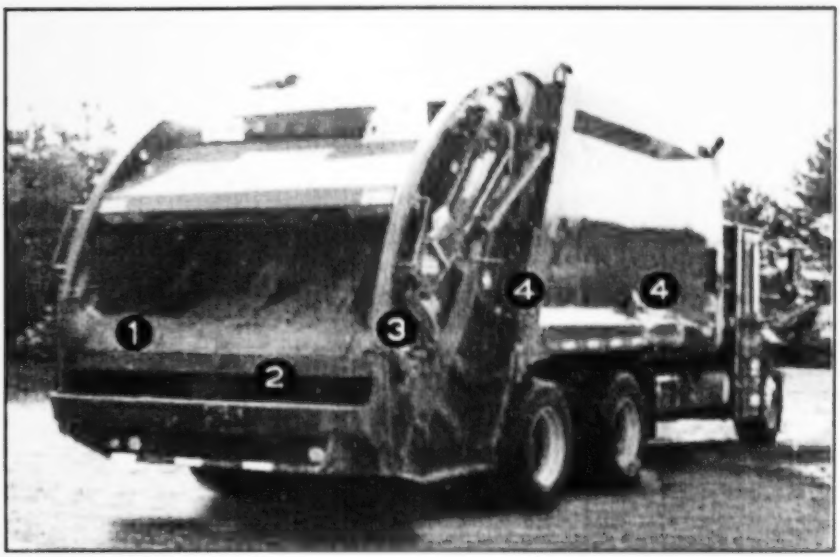
3. **Either:**

   (a) An additional set of sustained manual pressure controls for each additional worker shall be provided. The actuation of the controls shall take place concurrently in order to complete the packing cycle. The controls shall be located so that a worker cannot reach any pinch point and that the worker cannot operate more than one set of controls. All controls should be located on the side of the vehicle opposite the normal traffic side.

   Or

   (b) A presence-sensing device shall be provided that will stop the motion to prevent access to the projectile hazard zone and the pinch-point. The installation of suitable presence sensing devices shall be subject to a formal risk assessment and such presence sensing devices shall be in compliance with IEC 61496 (for application/installation see IEC TS 62046).

Figure 1 – Rear-loading compacting equipment



1. Packer panel
2. Packer panel in interrupted cycle position
3. Packer controls
4. Sustained manual pressure controls

Figure 2 - Rear-loading compacting equipment

1. Packer controls
2. Provision for "clear view" & preventing worker from reaching the point-of-operation
3. Sustained manual pressure control

Side-loading compacting equipment

A worker(s) shall be protected from any pinch point at the point-of-operation of the crusher panel mechanism by the following safety features:

(A) A moveable guard(s) that is interlocked so that the guard is in place before the crusher panel cycle is started. The moveable guard shall be designed so that it shall not be hazardous in itself and so that the hazard from projectiles during the crushing cycle is eliminated. For guard interlocking see Appendix "A".

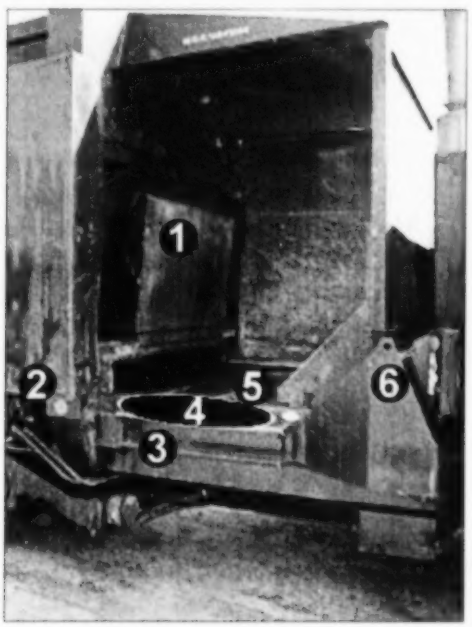
Or by <u>all</u> of the following safety features:

(B) 1. Actuation of the control for the crusher panel cycle shall be by sustained manual pressure. The control shall be located so that the worker actuating the control:

(i) cannot reach any pinch point at the point of operation; and

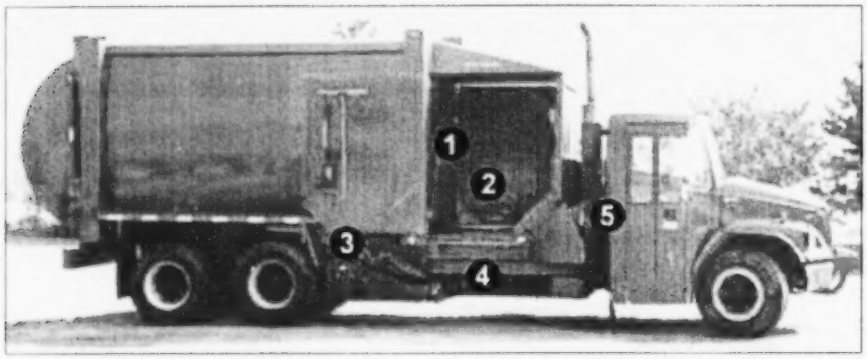
(ii) has a clear view of the point of operation

Figure 3 – Side-loading compacting equipment



1. Crusher Panel
2. Crusher Panel Controls
3. Emergency Stop Bar
4. Loading Sill
5. Compactor Ram
6. Compactor Controls

Figure 4 – Side-loading compacting equipment



1. Crusher panel
2. Hopper opening
3. Crusher panel controls
4. Emergency stop bar
5. Compactor controls

2. The controls shall be located on the side of the vehicle used for loading. The door at the opposite side of the truck shall be interlocked with the crusher panel operation. (The 'guard interlock' feature is to ensure that the crusher movement shall have stopped before the loading door can be opened.)

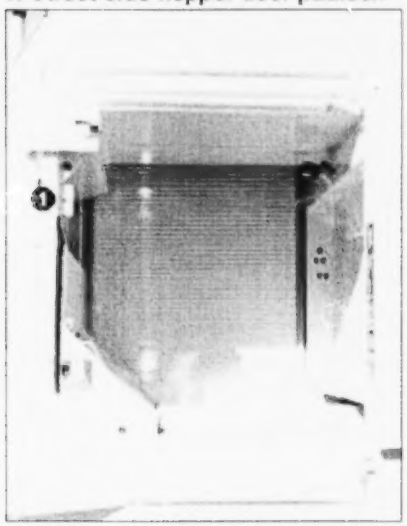
   Or

   The door shall be pad-locked.

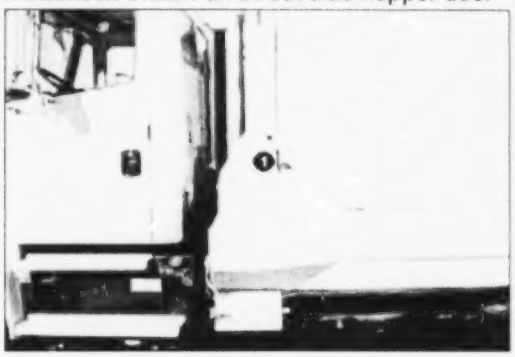
3. An additional set of sustained manual pressure controls for each additional worker shall be provided. The actuation of the controls shall take place concurrently for the full crusher panel cycle. The controls shall be located so that the additional worker cannot reach any pinch point and that the additional worker cannot operate more than one set of controls. If the door at the opposite side of the truck is not interlocked with the crusher panel operation, the door shall be pad-locked with an additional individual padlock for each additional worker.

Figures 5 & 6 – Side-loading compacting equipment

1. Street-side hopper door padlock



1. Interlock switch on street side hopper door



In addition to the above, the following general safety features/procedures are required and shall be reflected in written company safety policies and procedures:

(a) Loading platforms shall be removed unless equipped with a pressure sensitive protective device, or equivalent, giving due consideration to the environmental requirements under which such device/system has to reliably function, including requirements for a self-cleaning slip-resistant loading step surface as outlined in 7.2.10(a) of ANSI Z245-1. The pressure-sensitive protective device/system shall stop the compacting ram movement when a worker steps onto the loading platform. The compacting ram interrupt cycle shall be subject to a manual reset function.

(b) The vehicle or loading platform shall not to be equipped with a grab handle to ensure that the loading platform is not used as a riding step.

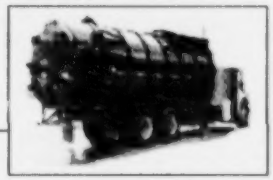
(c) The number of ram compacting cycles initiated by a single activation of the controls shall not exceed three (3).

(d) Any worker access to compacting spaces within the vehicle shall be subject to full 'lock-out' and 'lock-out' procedures.

(e) Emergency stop bars shall be in easy reach of the point of operation and must extend across the width of the bottom part of the hopper opening.

Note: In the event that an additional worker is performing a "restricted driving-only" function as a result of WSIB "modified work" provisions, additional manual pressure controls are not required.

Side-loading compacting equipment: Type II (Torpedo Design)



The worker shall be protected from any pinch point at the point-of-operation of the compacting panel by the following safety features:

(A) A moveable guard(s) that is interlocked so that the guard is in place before the compacting cycles is started. The moveable guard shall be designed so that it shall not be hazardous in itself and so that the hazard from projectiles during the compacting cycle is eliminated. For guard interlocking requirements see Appendix "A".

Or by all of the following safety features:

(B) 1. Actuation of the control for the compacting panel shall be by sustained manual pressure. The control shall be located so that the worker actuating the control:

   (i) cannot reach any pinch point at the point of operation; and

   (ii) has a clear view of the point of operation

2. An additional set of sustained manual pressure control for each additional worker shall be provided. The actuation of the controls shall take place concurrently for the full compacting cycle (movement across the full hopper opening). The controls shall be located so that the worker cannot reach any pinch point and that the worker cannot operate more than one set of controls.

In addition to the above requirements for point of operation guarding the following general safety features/procedures are required which shall be reflected in written company safety policies and procedures.

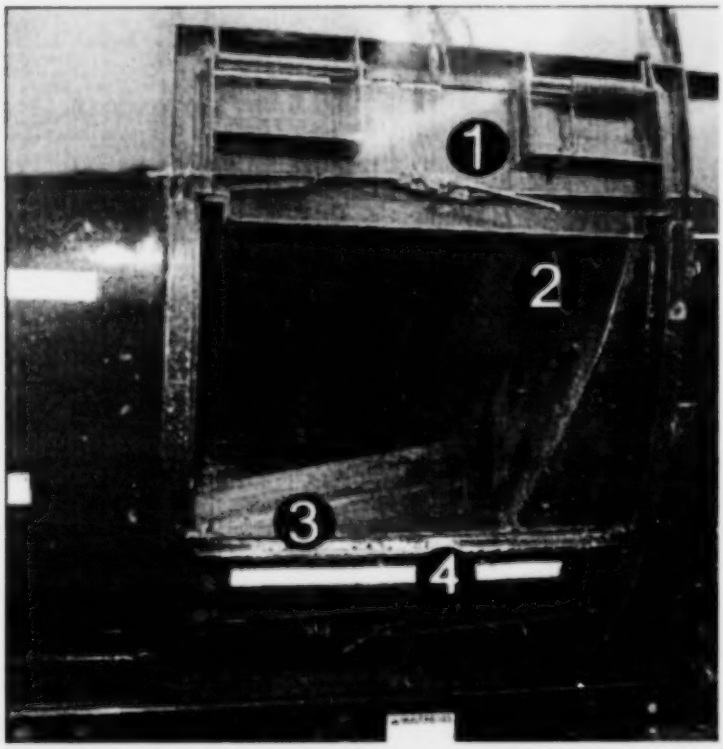
(a) Loading platforms shall be removed unless equipped with a pressure sensitive protective device, or equivalent, giving due consideration to the environmental requirements under which such device/system has to reliably function, including requirements for a self-cleaning, slip-resistant, loading step surface as outlined in 7.2.10(a) of ANSI Z245-1. The pressure-sensitive protective device/system shall stop the compacting ram movement when a worker steps onto the loading platform. The compacting ram interrupt cycle shall be subject to a manual reset function.

(b) The vehicle or loading platform shall not to be equipped with a grab handle to ensure that the loading platform is not used as a riding step.

(c) Any worker access to compacting spaces within the vehicle shall be subject to full 'lock-out' and 'lock-out' procedures.

(d) Emergency stop bars shall be in easy reach of the point of op eration and must extend across the width of the bottom part of the hopper opening.

Figure 7 - Side-loading compacting equipment: Type II (Torpedo Design)



1. Movable interlocked guard
2. Compacting panel
3. Loading sill
4. Emergency stop bar

NOTE: Controls for compacting panel not shown (at cab door post inside cab, operated from outside of cab for full view of compacting operation)

Rear-loader & Side-loader container lifting equipment

A worker shall be protected from any pinch point at the point-of-operation during the container raising-dumping-return cycle by the following: (photo and Fig. 8 shows one type of container only, requirements apply to all container lifting operations).

(A) Any pinch point within the container raising-dumping-return assembly and/or between the container raising-dumping-return assembly and the vehicle body shall be guarded to prevent worker access.

OR

(B) The control for raising-dumping-returning the refuse container shall be located so that the worker actuating the control:

(i) Cannot reach any pinch point at the point-of-operation; **and**

(ii) has a clear view of the point-of-operation

The worker operating the controls must be in full and clear view of the raising-dumping-return mechanism operation to be able to stop the motion at any time to prevent any injury to an additional worker who is part of the operation or to any other worker.

The actuation of the control for raising-dumping-returning the refuse container (for side loader container lifting application only, see Fig. 8) shall be in two stages:

(1) An initial 'container engagement' cycle is carried out with one hand of the operator positioning the container to ensure proper engagement with the raising-dumping-return mechanism while the other hand is occupied operating the sustained manual pressure controls. This, in conjunction with written procedures implemented for the safe operation of the container engagement cycle, is considered to provide adequate protection for the worker.

(2) Once the containers are engaged, the actuation of the controls for the complete raising-dumping-return cycle shall be by sustained manual pressure controls that are positioned to prevent the worker from reaching any pinch point at the point-of-operation.

The controls shall be located on the side of the vehicle opposite the normal traffic side.

Figure 8 – Rear-loader and side-loader lifting equipment

1. Sideloader container lifting assembly
2. Emergency stop bar (both sides of the container lifting assembly)

Multi-compartment recycling vehicle

A worker shall be protected from any pinch point at the point of operation of the container lifting-dumping-return cycle by the following safety features:

(a) Actuation of the control for the container lifting-dumping-return cycle shall be by sustained manual pressure. The controls shall be located so that the worker actuating the control:

(i) cannot reach any pinch point at the point-of-operation; and

(ii) has a clear view of the point of operation.

In addition to the above, the following general safety features (procedures) shall be included:

(b) Written procedures shall be established, maintained and enforced so that at no time a worker(s) without adequate protection be permitted access to upper truck sections to check or correct operational problems. This will include lockout provisions and procedures as per section 76 of Regulation 851 and blocking of elevated components as per section 75 of Regulation 851. When working on the elevated container lifting-dumping-return mechanism or associated devices it is necessary to provide appropriate fall protection, a precaution reasonable in the circumstances for the protection of the worker.

At or above heights of three meters, the fall arrest system shall be in compliance with section 85 of Regulation 851.

(When using a travel restraint system, a fall restricting system, a horizontal life line or a guardrail system as fall protection methods, see requirements outlined in section 26 of the Construction Projects Regulation, O. Reg. 213/91.)

(c) Access onto equipment en route should only be permitted for emergency, maintenance, service and repair work (not for operational purposes) with appropriate safety measures in place to protect the worker(s).

Figure 9 – Multi-compartment recycling vehicle

1. Loading bins
2. Controls for "lifting-dumping-return" cycle of located in vehicle cab (operated from outside the cab)

Combination collection equipment or mobile waste compacting equipment not covered in this guideline (i.e. Side-loading/Recycling vehicles)

Combining of several operations in one vehicle may introduce additional hazards not covered by the specific equipment sections of this guideline that address individual functions only. Such multi-functional vehicles or any vehicle not identified in this guideline shall comply with the point of operation guarding requirements of sections 25 & 26 or 28 of Regulation 851 and lockout and blocking requirements of sections 75 & 76 and any other applicable section of Regulation 851.

Front-loading and compacting equipment

Worker access onto front-loading equipment while trucks are out on the road collecting waste containers (as opposed to being serviced in the shop), should only be permitted for emergency, maintenance, service and repair work (not for operational purposes) with appropriate safety measures in place to protect the worker(s). See requirements outlined in multi-compartment recycling vehicle section b) of this guideline.

Figure 10 – Front-loading compacting equipment (loading forks retracted)

Figure 11 - Front-loading compacting equipment (loading forks extended)

Appendix "A"

Information for movable interlocked guards used for point of operation guarding and general information for maintaining integrity of control system safety functions

Moveable Guard General Requirements:

The moveable guard selected for guarding the point of operation of:

- The compactor blade of the side-loading compacting equipment, Figure 7 Type II (Torpedo Design);
- The crusher panel operation of the side-loading equipment, Figure 3;
- The packer panel of the rear-loading equipment, Figure 1;

The moveable guard requires compliance with ISO 14120 "Guards-General requirements for the design and construction of fixed and movable guards" and the interlocking of the guard requires compliance with ISO 14119 "Interlocking devices associated with guards – principles for design and selection".

Note:

The preferred interlocking method is a dual-control system interlocking with cross-monitoring. Dual-control system interlocking without cross-monitoring would be acceptable if the guard interlocking system, selected and designed for its hostile environment, is checked and tested on a regular basis. The channels in this application would need to be in different media (hydraulic and electrical) to obtain an improvement in integrity due to the reduced probability of common cause failure. The guard interlocking devices are required to be fitted in opposite modes. The two switches (valve) are operating in opposite modes, each actuated by its own cam arrangement.

(This arrangement covers common cause failures due to cam failure or guard misalignment and the improvement in safety of the interlocking system outweighs the reduction in integrity of the channel with a non-positive mode device, see 5.41 of ISO 14120.)

Routine inspection and testing should be carried out at a frequency appropriate to ensuring the continued integrity of all safety related control functions. This applies as well to all hydraulic components/systems (i.e. cylinders and valves) effecting safety functions. It is recommended that all hydraulic systems are in conformance with ISO 4413 "Safety requirements for fluid power systems and components".

Mobile Compacting Equipment Safety Guideline

References

- Occupational Health and Safety Act (OHSA)
- Regulations for Industrial Establishments (Reg. 851)

Occupational Health & Safety Act, 1990

Section 25 – Duties of Employers

25. (1) An employer shall ensure that,

(a) the equipment, materials and protective devices as prescribed are provided;

(b) the equipment, materials and protective devices provided by the employer are maintained in good condition;

(c) the measures and procedures prescribed are carried out in the workplace;

(d) the equipment, materials and protective devices provided by the employer are used as prescribed; and

(e) a floor, roof, wall, pillar, support or other part of a workplace is capable of supporting all loads to which it may be subjected without causing the materials therein to be stressed beyond the allowable unit stresses established under the *Building Code Act*.

(2) Without limiting the strict duty imposed by subsection (1), an employer shall,

(a) provide information, instruction and supervision to a worker to protect the health and safety of the worker;

(b) in a medical emergency for the purpose of diagnosis or treatment, provide, upon request, information in the possession of the employer, including confidential business information, to a legally qualified medical practitioner and to such other persons as may be prescribed;

(c) when appointing a supervisor, appoint a competent person;

(d) acquaint a worker or a person in authority over a worker with any hazard in the work and in the handling storage, use, disposal and transport of any article, device, equipment or a biological, chemical or physical agent;

(e) afford assistance and co-operation to a committee and a health and safety representative in the carrying out by the committee and the health and safety representative of any of their functions;

(f) only employ in or about a workplace a person over such age as may be prescribed;

(g) not knowingly permit a person who is under such age as may be prescribed to be in or about a workplace;

(h) take every precaution reasonable in the circumstances for the protection of a worker;

(i) post, in the workplace, a copy of this Act and any explanatory material prepared by the Ministry, both in English and the majority language of the workplace, outlining the rights, responsibilities and duties of workers;

(j) prepare and review at least annually a written occupational health and safety policy and develop and maintain a program to implement that policy;

(k) post at a conspicuous location in the workplace a copy of the occupational health and safety policy;

(l) provide to the committee or to a health and safety representative the results of a report respecting occupational health and safety that is in the employer's possession and, if that report is in writing, a copy of the portions of the report that concern occupational health and safety; and

(m) advise workers of the results of a report referred to in clause (1) and, if the report is in writing, make available to them on request copies of the portions of the report that concern occupational health and safety.

(3) For the purposes of clause (2) (c), an employer may appoint himself or herself as a supervisor where the employer is a competent person.

(4) Clause (2) (j) does not apply with respect to a workplace at which five or fewer employees are regularly employed. R.S.O. 1990, c. O.1, s. 25.

Section 27 - Duties of Supervisor

27. (1) A supervisor shall ensure that a worker,

(a) works in the manner and with the protective devices, measures and procedures required by this Act and the regulations; and

(b) uses or wears the equipment, protective devices or clothing that the worker's employer requires to be used or worn.

Additional duties of supervisor

(2) Without limiting the duty imposed by subsection (1), a supervisor shall,

(a) advise a worker of the existence of any potential or actual danger to the health or safety of the worker of which the supervisor is aware;

(b) where so prescribed, provide a worker with written instructions as to the measures and procedures to be taken for protection of the worker; and

(c) take every precaution reasonable in the circumstances for the protection of a worker. R.S.O. 1990, c. O.1, s. 27.

Section 28 - Duties of workers

28. (1) A worker shall,

(a) work in compliance with the provisions of this Act and the regulations;

(b) use or wear the equipment, protective devices or clothing that the worker's employer requires to be used or worn;

(c) report to his or her employer or supervisor the absence of or defect in any equipment or protective device of which the worker is aware and which may endanger himself, herself or another worker; and

(d) report to his or her employer or supervisor any contravention of this Act or the regulations or the existence of any hazard of which he or she knows.

Idem

(2) No worker shall,

(a) remove or make ineffective any protective device required by the regulations or by his or her employer, without providing an adequate temporary protective device and when the need for removing or making ineffective the protective device has ceased, the protective device shall be replaced immediately;

(b) use or operate any equipment, machine, device or thing or work in a manner that may endanger himself, herself or any other worker; or

(c) engage in any prank, contest, feat of strength, unnecessary running or rough and boisterous conduct.

❖ Industrial Establishments Regulation (Reg. 851)

Section 12 – Premises

Clearances between a moving part of any machine or any material carried by the moving part of the machine and any other machine, structure or thing shall be adequate to ensure that the safety of any worker in the area is not endangered. R.R.O. 1990, Reg. 851, s. 12.

Section 25 – Machine Guarding

An in-running nip hazard or any part of a machine, device or thing that may endanger the safety of any worker shall be equipped with and guarded by a guard or other device that prevents access to the pinch point. R.R.O. 1990, Reg. 851, s. 25.

Section 26 – Machine Guarding

A machine shall be shielded or guarded so that the product, material being processed or waste stock will not endanger the safety of any worker. R.R.O. 1990, Reg. 851, s. 26.

Section 75 – Maintenance and Repairs (Blocking)

A part of a machine, transmission machinery, device or thing shall be cleaned, oiled, adjusted, repaired or have maintenance work performed on it only when,

(a) motion that may endanger a worker has stopped ; and

(b) any part that has been stopped and that may subsequently move and endanger a worker has been blocked to prevent its movement. R.R.O. 1990, Reg. 851, s. 75.

Section 76 – Maintenance and Repairs (Lock-Out)

Where the starting of a machine, transmission machinery, device or thing may endanger the safety of a worker,

(a) control switches or other control mechanisms shall be locked out; and

(b) other effective precautions necessary to prevent any starting shall be taken. R.R.O. 1990, Reg. 851, s. 76; O. Reg. 230/95, s. 1.

Section 85 – Protective Equipment

Where a worker is exposed to the hazard of falling and the surface to which he or she might fall is more that three metres below the position where he or she is situated,

(a) the worker shall wear a serviceable safety belt or harness and lifeline adequately secured to a fixed support and so arranged that the worker cannot fall freely for a vertical distance of more than 1.5 metres; and

(b) the fall arresting system described in clause (a) shall,

(i) have sufficient capacity to absorb twice the energy and twice the load that under the circumstances of its use may be transmitted to it, and

(ii) be equipped with a shock absorber or other devices to limit the maximum arresting force to 8.0 kilonewtons to the wearer. R.R.O. 1990, Reg. 851, s. 85.

Standards Listed in the Guideline

ANSI (American National Standards Institute) Z245.1-1999 for equipment technology and Operations for Wastes and Recyclable Materials-Mobile Waste and Recyclable Materials Collection, Transportation, and Compacting Equipment Safety Requirements

IEC (International Electrotechnical Commission) 61496-1:1997 Safety of machinery-Electro-sensitive protective equipment Part 1: General requirements and tests

IEC (International Electrotechnical Commission) 61496-2:1997 Safety of machinery-Electro-sensitive protective equipment Part 2: Particular requirements for equipment using opto-electronic protective devices (AOPDs)

IEC (International Electrotechnical Commission) TS 62046 Safety of machinery – application of protective equipment to detect the presence of persons

ISO (International Standards Organization) 14120 Guards-General requirements for the design and construction of fixed and movable guards

ISO (International Standards Organization) 14119 Interlocking devices associated with guards - principles for design and selection

ISO (International Standards Organization) 4413 Safety requirements for fluid power systems and components - Hydraulics

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Mobile Compacting Equipment Safety Guideline

Questions & Answers

May 2004

This information has been prepared to assist employers, workers, constructors, supervisors, owners, suppliers, and others who have duties under the Occupational Health and Safety Act and its regulations. It should not be taken to be a statement of the law or what is necessary to comply with the law. A person with legal duties may or may not agree with these answers and there is no legal requirement to follow it. It is for each such person to decide what is necessary to comply with the act and its regulations.

A person who needs assistance in determining what constitutes compliance should consult with his or her legal advisor. Ministry inspectors will assess workplace situations against the relevant provisions in the act and its regulations but they do not enforce these answers, although they may refer to it in determining whether the law has been complied with.

1. What is a 'pinch point'?

A pinch point is a point at which it is possible for a part of the body to be caught between moving parts and/or moving and stationary parts of equipment.

The ANSI definition of pinch point is as follows:

> ***"Points at which it is possible to be caught between moving parts, or between moving and stationary parts of a piece of equipment."***

2. What is the 'point-of-operation' in relation to mobile compacting equipment?

The point-of-operation is the area of the equipment where the waste is actually loaded into the vehicle. This is the point where the waste is placed into the vehicle either manually or by mechanical means, as is the case with container-lifting devices.

3. What is the difference between the 'crusher panel' and the 'compacting ram'?

The compacting ram is used to push the waste to the back of the vehicle. Currently the guidelines permit the compacting ram to cycle (move back and forth) three times with a single activation by the operator.

The crusher panel is a panel that is used to 'compress' waste so that it can be pushed by the compacting ram to the back of the vehicle. It is only used when the height of the waste is higher than the opening leading to the back of the vehicle. As a result it is normally only used intermittently and not with each cycle of the compacting ram.

4. What is 'sustained pressure' relative to controls?

A control, which is operated by sustained pressure, means that the control permits movement only as long as the control is held in a set position. When the control is released it then returns to the stop position. In the context of the guidelines it means controls that require continual pressure from one or both hands of a worker to operate. If hand(s) are removed from the control the equipment, operation stops.

5. What does 'hopper opening' mean?

The hopper opening is a term used in reference to side-loading compacting equipment. It represents the opening through which solid waste is thrown into the hopper, which contains the compacting ram. In some cases the hopper opening is reduced by side baffles or plates. For side-loading equipment the emergency stop bar is to extend across the usable horizontal width of the bottom of the hopper opening. For combination collection equipment the container lifting mechanism may prevent the emergency stop bar from extending across the full width of the opening. The emergency stop bar is to be within easy reach of the operator.

6. How is 'clear view' defined?

This term is used in reference to rear loading and other refuse compacting trucks where the controls are at the side of the truck and if not positioned correctly may prevent the operator from being able to have a clear view of the point-of operation. For this type of equipment it is critical that the operator have this clear view of the complete area of the point of operation to ensure that when the packer panel is moving downward it can be stopped if another worker is within easy reach of the pinch point.

7. Does a loading step on a side-loader compromise the 42" criteria relative to guarding?

The ANSI Standard Z245.1-1999 American National Standard for Equipment Technology and Operations for Wastes and Recyclable Materials – Mobile Wastes and Recyclable Materials Collection, Transportation, and Compacting Equipment – Safety Requirements in clause 7.3.3.2 states: "A Type B side-loader [Figure 8(b)] having a loading height of not less than 107 cm (42 in) measured from the ground to the loading sill, shall be considered as meeting the requirement of clause 7.2.8 (point of operation protection)".

The use of loading platforms is not permitted in this standard unless equipped with a pressure sensitive protective device, or equivalent, which stops the ram movement when a worker steps onto the loading platform.

This guideline sees a loading step that is not interlocked with the ram operation as compromising the 42-inch-criteria.

The guideline anticipates that side-loader operations involve one worker and provisions in the guideline and Q & A response are for one worker operation only. Additional precautions may be necessary for side-loaders operating with two or more workers.

Recent critical and fatal accidents in Ontario caused by workers riding on the loading step make it necessary to consider the removal of the loading platform, and the vehicle or loading platform shall not be equipped with a grab handle to ensure that the loading platform is **not** used as a riding step.

The guideline recognizes the need for workers to utilize the step when handling heavy loads on a repetitive basis and therefore permits the loading step to remain in place if equipped with a pressure sensitive protective device. The pressure sensitive device stops the compacting ram movement when a worker steps onto the loading platform. The compacting ram interrupt cycle shall be subject to a manual reset function.

8. Is a clear plexi-glass window in the body of a rear-loader acceptable in providing the operator a clear view of the point-of-operation?

The use of plexi-glass is not recommended but may be acceptable if the requirement to providing the operator a full view of the point-of-operation is met. Please note the requirement is for the complete point-of-operation to be in clear view of the operator, from one side to the other over the full width of the rear of the truck.

Regular cleaning and maintenance to ensure that the plexi-glass is clear is necessary for the plexi-glass opening to provide 'clear view' as required in the guideline.

The expanded metal section at the rear of the rear-loading truck shown in the guideline fulfills the clear view point of operation requirement; as well, it fulfills the requirement to prevent the worker to reach the point of operation with his/her lower limb (foot) when standing on the riding step while operating the controls. (Reference is made to the critical accident where the operator was able to reach the point of operation with a foot.)

The expanded metal arrangement prevents the worker from reaching the point-of-operation and gives the operator a clear view of the point of operation. It fulfills the requirements under (B) 1 & 2 of the guideline.

9. Will additional sustained pressure controls be required for 'trainers' when instructing or training workers?

The requirement for additional sustained pressure controls for trainers is only required for rear loading refuse compacting and side-loading type II (Torpedo design) vehicles. This is due to the fact that this type of equipment is more hazardous than other equipment and the extra controls are deemed necessary.

10. Are all aspects of the ANSI standard enforceable by the Ministry of Labour since it forms part of the guideline?

Relevant aspects of the ANSI standard may be enforced, as reasonable precautions, under section 25(2)(h) of the OHSA by the Ministry of Labour other than those specifically covered by Ontario Regulations.

11. Does this guideline apply to anyone other than workers?

The legislation that the Ministry of Labour is responsible for enforcing (Occupational Health & Safety Act and Regulations) is generally intended to protect 'workers'.

It may be prudent to identify health and safety risks to members of the public so that equipment operators will be aware of potential hazards and take necessary precautions.

12. Does this guideline apply to both the private sector and municipalities & other public sector agencies and workers?

These guidelines apply in every situation where workers are using the equipment mentioned to collect solid waste.

13. Will the Ministry of Labour apply this guideline consistently and uniformly across the province?

The Ministry of Labour is committed to full practical training of ministry inspectors to encourage application of the guideline consistently and uniformly across the province.

14. Should this guideline be incorporated into municipal/company safety policies and employee training programs?

Yes, the guidelines should be incorporated into municipal/company policies and employee training. In subsection 25(2)(j) of the Occupational Health and Safety Act the employer is required to prepare a written occupational health and safety policy and set up a program to implement it. The programs will vary, depending upon hazards encountered in a particular workplace. Certainly one of the elements would be guarding which is covered by the guidelines.

In addition the act also requires employers to:

- instruct, inform and supervise workers to protect their health and safety [section 25(2)(a)]
- inform a worker, or a person in authority over a worker, about any hazard in the work and train that worker [section 25(2)(e)]

In order for employers to comply with the above-mentioned duties supervisors and workers would need to be trained on the correct application of the guidelines.

ISBN 0-7794-6175-4

May 2004